Multitweezers generation using dark soliton pulses and applications

Abstract:

Multi-dark soliton pulses have been successfully generated by using forward and backward pumping of the S-band erbium doped fiber in the fiber optic loop, where the Stimulated Brillouin Scattering (SBS) is a nonlinear interaction between pump fields with Stokes field through acoustic wave. Results obtained have shown that the dark soliton trains can be generated and configured as the multi-optical tweezers. The advantage is that the generated tweezers are in the form of dynamic tweezers, where they can transmit/transport via the soliton communication link. The single dark soliton is also experimentally generated by using the different fiber optic scheme. We have also theoretically shown that the dynamic tweezers can be controlled and tuned, which is available for trapping and transportation in the communication link via a wavelength router. The quantum states of the transported atoms/molecules by the dynamic tweezers can be performed by using the quantum processing unit incorporating in the system.